

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF:

Kent E. Regnier

SERIAL NO.: 09/482,135

EXAMINER: C. Prasad

FILED: January 12, 2000

ART UNIT: 2839

FOR: CONNECTOR HAVING SUPPORTIVE BARRIER COMPONENT

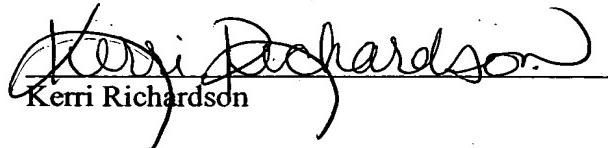
APPEAL BRIEF FOR APPLICANTS

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicants: Kent E. Regnier

Application: CONNECTOR HAVING SUPPORTIVE BARRIER COMPONENTS

Serial No.: 09/482,135

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Art Unit: 2839

Examiner: C. Prasad

Case: 99-247 US

APPEAL BRIEF FOR APPLICANTS

This is an appeal from a final rejection of claims 1-27 that are pending in the present application. The final rejection was made in an Official Action issued in connection with the present application on November 7, 2001, from which a Notice of Appeal was mailed on March 7, 2002 and was received by the Patent Office on March 18, 2002. In accordance with 37 C.F.R. § 1.192(c)(9), the claims pending in the present application and involved in this Appeal are set forth in the attached Appendix A.

I. REAL PARTY IN INTEREST

The real party in interest is Molex Incorporated, a Delaware corporation having a place of business at 2222 Wellington Court, Lisle, Illinois 60532. Molex Incorporated is the real party in interest by virtue of an Assignment executed by the applicant on January 11, 2000 and recorded in connection with the present application in the United States Patent and Trademark Office on January 12, 2000 on Patent Reel No. 010492, Frame No. 0060.

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II. RELATED APPEALS AND INTERFERENCES

Applicants and Molex Incorporated, the assignee of the present application, are not aware of any other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal of the present application.

III. STATUS OF THE CLAIMS

The status of the claims in the present application is as follows:

1. Total claims: 1-27.
2. Claims canceled: None.
3. Claims withdrawn from consideration but not canceled: 28-30.
4. Claims pending: 1-27.
5. Claims allowed: None.
6. Claims objected to: None.
7. Claims rejected: 1-27.
8. Claims appealed: 1-27.

IV. STATUS OF AMENDMENTS

The applicant did not file an Amendment Under 37 C.F.R. § 1.116 in response to the November 7, 2001 Official Action finally rejecting claims 1-27, but did file remarks with the U.S.P.T.O.

V. SUMMARY OF THE INVENTION

A. Background

Electronic packages having miniature and microminiature electronic components are characterized by being especially small, dense and more efficient, leading to many

challenges, including those associated with physically and electrically connecting package components together. Examples of packages include chips which are characterized by having a high circuit count in a small area. Often, these dense conditions include providing an array of terminals or contacts which are closely spaced from one another and which must remain electrically insulated from one another so as to provide a plurality of discrete electrical connections, typically in an ordered, predetermined array. An example of a connector of this type is one having a land grid array of contact pads.

An approach which has been developed for manufacturing such miniature and microminiature contact systems involves electroforming using a gold wire bonding preform. In this approach, the printed circuit board component is manufactured, as is the gold wire bonding preform. The preform is attached to the board, followed by plating and electroforming the contact, requiring approximately a two hour plating process in order to plate the contact finish. This process next etches and individualizes the contact. Overall, this process includes mask placement, followed by paste placement and solder ball placement, with attendant reflow. Thereafter, removal from the panel is carried out. This technology is exemplified by U.S. Patents No. 5,476,211 and No. 5,864,946. A characteristic of this technology is that it is suitable for low normal force systems of about 1 gram per mil. Another characteristic of this approach is that the contacts have limited compliance, the total range being 0.015 inch, and the working range being 0.008 inch. The electrical characteristics are as follows: self-inductance of 1.78 nh, loop inductance of 2.0 nh, and impedance of 90 ohms. Systems of this type are also characterized as being expensive.

While the approach summarized in the preceding paragraph is useful in addressing

miniaturization and microminiaturization of contact systems, its attendant disadvantages, especially its limited compliance and cost, reduce its desirability. Traditional contact system manufacturing approaches can be problematic when miniaturization to this degree is to be practiced. In addition to the complications which arise in manufacture and assembly of such small components, they also can be susceptible to undesired flow of liquids therethrough. For example, soldering flux can flow from a face of the grid being subjected to soldering to an opposite face of the grid which is to provide unsoldered contact functions. This latter concern is especially of interest in those applications where the connector does not experience contact wiping.

B. The Invention Of The Present Application

In accordance with the present invention, electrical connectors are provided which have a plurality of electrically conductive contacts within a dielectric housing. The electrically conductive contacts are mounted within receptacles or through holes which are arranged in a predetermined pattern so as to provide a desired number and positioning of the plurality of electrically conductive contacts. A supportive barrier member is associated with each of the mounts of the electrically conductive contacts within the dielectric housing. The barrier member is sized, shaped, selected and positioned so as to substantially prevent passage of liquid through the assembled connector, especially with respect to passage of soldering flux through the connector and from one face to the other.

The electrical connector of the present invention connects a first electronic component (not shown) to a second electronic component (not shown). As is well-known in the art, the first electronic component has an array of terminals, typically contact pad terminals, on a

surface thereof, while the second electronic component has a similar array of terminals, which can be contact pads and the like, on a surface thereof. A typical connector in accordance with the present invention is designed to be positioned between such electronic components and provide required electrical communication between them.

Illustrated electrical connector 21 includes a dielectric housing 22. The housing can be essentially a single piece unit, typically molded as a unitary member. Alternatively, the dielectric housing can be comprised of a series of elongated housing components or strips 23, sometimes referred to as sticks (FIGS. 5 and 6) which are assembled together within a suitable frame such as generally shown at 24 in FIG. 1.

However constructed, the dielectric housing has a plurality of substantially open receptacles 25 (FIG. 2). When the connector 21 is properly disposed between the electronic components, the receptacles 25 substantially align between corresponding contact pads or the like (not shown) of these components. In a typical arrangement, these two electronic components can have identically-spaced arrays of contacts or terminals, which arrays preferably correspond to the receptacles of the housing. Dielectric housing 22 has a first surface 26, shown as a top surface, and a second surface 27, shown as a bottom surface. In use, the top surface is positioned generally adjacent a first electronic component, and the bottom surface is positioned generally adjacent a second electronic component.

An electrically conductive contact element is disposed within at least one of the receptacles 25. An inserted, but not formed, contact element is generally designated as 28 in FIGS. 2, 3 and 4. In the illustrated embodiment, the contact 28 is an assembly of a shaft 31 and a pad 32. Electrically conductive contact element 28 alternatively can be made as a single piece

member which is not an assembled member. In the preferred embodiment which is illustrated, the longitudinal axis of the unformed contact element 28 generally coincides with a through axis "A" of the receptacle 25. This is the as-assembled orientation.

With more particular reference to the assembly illustrated in FIGS. 2, 3 and 4, a retention member 33 is included. Retention member 33 is positioned within the substantially open receptacle 25 so as to be maintained therewithin after assembly and forming has been completed. This retention member also functions as a barrier to liquid passage through the receptacle 25.

In this illustrated embodiment, the retention member 33 has an opening 34 which receives the shaft 31 of contact element 28. Illustrated opening 34 is coaxial with through axis "A" and is of a size which cooperates with the outer surface of the shaft 31 in order to provide a force fit therebetween. It also is preferred that the external surface of retention member 33 have a force fit with respect to a portion of the substantially open receptacle 25. When these preferred force fits are provided, the retention member 33 functions as an assembly aid during the assembly procedure and as an essentially advantageous retention and barrier member after assembly and forming is completed.

In the illustrated embodiment, the receptacle 25 includes a stop surface 35. The retention member 33 is positioned between this stop surface 35 and a portion of the electrically conductive contact 28. In the illustrated embodiment, this portion of the contact is an abutment surface 36 of the pad 32. In a further preferred arrangement, the receptacle 25 has a secondary stop surface 37 which can engage another portion of abutment surface 36 of the contact pad 32. During assembly, the retention member 33 can engage temporarily this secondary stop surface 37

until proper seating is achieved between the retention member 33 and the stop surface 35.

The close fit or force fit provided by the retention member imparts an ungapped condition to the electrical connector assembly. That is, there is a close fit and thus no gaps between the outside surface of the shaft 31 and the opening 34 of the retention member 33. Likewise, this condition exists between the outside surface of the retention member 33 and the receptacle 25. With more particular reference to this latter element of the ungapped condition, it is preferred that there be an ungapped force fit between the outside surface of the retention member 33, which is cylindrical in the illustrated embodiment, and the anterior surface 41 of the receptacle which is between the stop surface 35 and the secondary stop surface 37. It is further preferred that the thickness of the retention member 33 be such that there is an ungapped force fit of the retention member 33 between the stop surface 35 and the abutment surface 36 of the contact element 28. It is contemplated that the retention member may be oversized with respect to its nesting position within the housing receptacle and thus will be compressed somewhat in the fully assembled condition of the connector.

The function provided by the retention member 33 is facilitated by having it constructed of a generally resilient material. It can be an extruded elastomeric component. In order to withstand typical package assembly conditions, the material of the retention member is to resist 219°C for at least 40 seconds. Materials suitable for the retention member include Viton, Neoprene, silicone rubber and the like.

Retention member 33 prevents passage of liquids such as solder flux which would be present during assembly at pads 32 and which could otherwise flow through the receptacles 25 and onto the shaft 31 at or above the first or top surface 26 of the housing 22. The retention

member further supports the contact element 28 in order to thereby add stability to the contact during manufacture but especially during use. Retention member 33 provides for a low stress press fit in order to address possible warpage of the device and while also minimizing the likelihood of any bending of shafts 31 during insertion. After full assembly, the retention member 33 thus provides barrier properties while also holding the contact element compliantly and rigidly.

In the illustrated preferred embodiment, the shaft 31 is formed after assembly into the housing. This is accomplished by bending shaft 31, to an orientation which is at an acute angle with respect to through access "A" as generally shown in FIG. 5 through FIG. 8. With the shafts 31 thus bent, the resulting formed electrically conductive contact elements 38 provide a retained contact array which can be oriented as needed. For example, it is possible to align the formed contact elements 38 according to an in-line arrangement as shown in FIG. 5 and FIG. 6. It will be noted particularly from FIG. 5 that the contacts themselves remain separated from each other by a thickness of the dielectric housing 22. This is made possible, at least in part, because the open receptacles 25 need not be so large as to accommodate post-formed contact elements. Instead, because the contact elements are inserted prior to forming same, the open receptacles 25 only need accommodate the unbent or unformed contact elements 28 during insertion. An array arrangement such as shown in FIG. 5 and FIG. 6 is suitable for a grid of 0.050 inch by 0.050 inch, for example.

In a typical use of the thus formed electrical connector 21, the pads 32 will be exposed to soldering conditions, which includes exposure to soldering flux. The soldering flux will tend to flow or wick into the receptacles 25, followed by subsequent passage toward the first

or top surface 26 and more particularly onto the shafts 31 formed as the terminals 39. It will be appreciated that the presence of a liquid such a soldering flux on the terminals 39 will interfere with the expected electrical properties of the connector. This problem is especially of concern in those applications in which there is very little relative movement between the terminals and an opposing component which might otherwise somewhat effectively wipe the liquid from the terminals. In addition, this structure according to the invention imparts no significant loading on the housing, which is a feature of the mechanical properties of the assembly in accordance with the invention.

VI. ISSUES ON APPEAL

This issues on appeal are as follows:

- A. Whether independent claims 1 and 22, and dependent claims 2-4, 6-8, 11-20, 23, 25 and 26 are rendered obvious under 35 U.S.C. § 103(a) by United States Patent No. 4,082,398 ("Bourdon et al.").
- B. Whether dependent claims 5, 9, 10, 21, 24 and 27 are rendered obvious under 35 U.S.C. § 103(a) by United States Patent No. 4,082,398 ("Bourdon et al.").

VII. GROUPING OF CLAIMS

In rejecting the claims, the Examiner has separated the claims into two groups. The first group includes claims 1-4, 6-8, 11-20, 22, 23, 25 and 26 and the second group includes claims 5, 9, 10, 21, 24 and 27. With respect to the first group of claims, claim 1 would be representative of those claims. Claim 9 would be representative of the second group of claims.

VIII. ARGUMENT

A. Claims On Appeal

All of the claims involved in this Appeal were finally rejected in the Official Action of November 7, 2001 because the Examiner maintained that claims 1-4, 6-8, 11-20, 22, 23, 25 and 26 were rendered obvious under 35 U.S.C. § 103(a) as being unpatentable over United States Patent No. 4,082,398 ("Bourdon et al.") and that claims 5, 9, 10, 21, 24 and 27 were rendered obvious under 35 U.S.C. § 103(a) as being unpatentable over Bourdon et al. It is the final rejection of those claims that resulted in the filing of this Appeal.

The claims on appeal are set forth in Appendix A. These claims are all directed to various embodiments of an electrical connector.

The claim indicated to be representative of the claims the Examiner has grouped in the first group of claims, *i.e.*, claim 1, recites an electrical connector comprising a dielectric housing having a plurality of substantially open receptacles arranged in an array which is suitable for an electrical connector. Each receptacle has a through axis. A plurality of electrically conductive contacts are positioned within at least some of said receptacles so as to provide an array of contacts arranged to be suitable for an electrical connector. A plurality of retention members are within the receptacle, at least one of said retention members engaging at least one of said contacts so as to impart an ungapped condition to the connector at the location of the retention member within the housing. The ungapped condition of the connector substantially prevents passage of liquid through the open receptacles having said retention members therewithin.

Claim 9, which is dependent on independent claim 1, is representative of those

claims that have been included by the Examiner in the second group. Claim 9 further defines an electrical connector wherein said contact has a terminal portion is bent after insertion into said receptacle.

B. The Cited Reference

The Examiner relied on one reference in rejecting the appealed claims: United States Patent No. 4,082,398 ("Bourdon et al."). The Bourdon et al. reference discloses electrical connector with insertable and removable contacts. Specifically, Bourdon et al. discloses a connector 1 having one (Fig. 10) or two (Fig. 1) contact inserts 10. The contact insert has a plurality of passages 15 for receiving contacts 20 therein. Each of the passages has a plurality of retention fingers 11 integral with the insert 10 for retaining the contacts 20 to the insert 10. The connector also includes a front moisture sealing grommet 30 and a rear moisture sealing grommet 40. However, the grommets 30 and 40 are not retention members, which means that the ungapped condition is not at the position of the position of the retention members. Rather, as clearly recited in the specification and disclosed in the figures of Bourdon, the retention fingers 11 retain the contacts 20 within the housing of Bourdon. The front and rear moisture sealing grommets 30, 40 are used to keep moisture out of the connector; they do not perform a retention function as this is accomplished with the retention fingers 11.

C. The Rejection Under 35 U.S.C. § 103(a)
Of Claims 1-27 Should Be Reversed

In the final Official Action of November 7, 2001, the Examiner included two separate 35 U.S.C. § 103(a) rejections. First, the Examiner asserted that claims 1-4, 6-8, 11-20, 22, 23, 25 and 26 were rendered obvious under 35 U.S.C. § 103(a) as being unpatentable over

United States Patent No. 4,082,398 (“Bourdon et al.”). As to claims 5, 9, 10, 21, 24 and 27, the Examiner concluded that those claims were rendered obvious under 35 U.S.C. § 103(a) as being unpatentable over Bourdon et al. In so rejecting the appealed claims under 35 U.S.C. § 103(a), the Examiner did not combine the references based on what is actually disclosed and suggested in the references. Instead, the Examiner has mischaracterized the disclosure of Bourdon et al. by characterizing it as rendering the claims of the present application obvious, and has used the applicant’s disclosure as a template for modifications that the Examiner claims are suggested by Bourdon et al. Accordingly, claims 1-27 define an electrical connector that is not disclosed in or suggested by what is disclosed in the single reference relied on by the Examiner in the final rejection, and the Board should reverse the Examiner’s 35 U.S.C. 103(a) rejections.

1. Bourdon et al. Does Not Render Claims 1-4, 6-8,
11-20, 22, 23, 25 and 26 Obvious Under 35 U.S.C. § 103(a)

Representative claim 1 recites an electrical connector comprising a dielectric housing having a plurality of substantially open receptacles arranged in an array which is suitable for an electrical connector. Each receptacle has a through axis. A plurality of electrically conductive contacts are positioned within at least some of said receptacles so as to provide an array of contacts arranged to be suitable for an electrical connector. A plurality of retention members are within the receptacle, at least one of said retention members engaging at least one of said contacts so as to impart an ungapped condition to the connector at the location of the retention member within the housing. The ungapped condition of the connector substantially prevents passage of liquid through the open receptacles having said retention members therewithin.

The Examiner characterizes Bourdon et al. as showing an electrical connector 1 having a housing 90 with a plurality of cylindrical receptacles, a plurality of contact members 20 received in the bores of the receptacle and a plurality of resilient retainers (seals) 30, 40 to provide an ungapped (sealed) connection between the contact member and the receptacles at the location of the retainer. The Examiner further characterizes Bourdon as having seals having openings, which fit over the contact, and that each receptacle provides a stop surface in an axial direction, and the inside cylindrical surface of the receptacles provide a stop in the radial direction. The Examiner additionally characterizes Bourdon in that the retainers abut against the stop surfaces and the contact has two portions on two sides of the retainer, which are within the housing.

As is clear from the description of Bourdon et al. at Section VIII.B. above, the seals 30, 40 do not act as retention members as characterized by the Examiner. Rather, Bourdon et al. discloses a connector 1 having one (Fig. 10) or two (Fig. 1) contact inserts 10. The contact insert has a plurality of passages 15 for receiving contacts 20 therein. Each of the passages has a plurality of retention fingers 11 integral with the insert 10 for retaining the contacts 20 to the insert 10. The connector also includes a front moisture sealing grommet 30 and a rear moisture sealing grommet 40. However, the grommets 30 and 40 are not retention members, which means that the ungapped condition is not at the position of the position of the retention fingers. *Thus, contrary to the Examiner's characterization of Bourdon et al., the grommets 30, 40 are not resilient retainers (seals). Rather, the retention fingers 11 are what retain the contacts 20 within the passages 15 of the insert 10. Moreover, the retention fingers 11 do not create an ungapped condition to the connector. Instead, in order to create an ungapped condition, a*

forward moisture sealing grommet 40 and a rear moisture sealing grommet 30 is required.

Thus, three separate items (retention fingers 11 and seals 30, 40) are required in Bourdon et al. to accomplish that which is accomplished by a single item (retention member 33) in the present invention.

In the February 11, 2002 Advisory Action, the Examiner stated that the applicant's remarks mailed on December 20, 2001 did not place the application in a condition for allowance because Bourdon et al.'s "members 10, 30, 40 provide both sealing as well as retention functions. [Bourdon et al.]'s members 30, 40 (called seals) provide retention of the contact member due to friction between the member and provides no gap between the seal member and the contact members (see Figure 10). Retaining inserts 10 also provide retention and ungapped condition between the retention fingers and the contact members 20 as shown in Figures 8 and 11." Once again, the Examiner resorts to mischaracterizing the disclosure of Bourdon et al.

First, there is no disclosure or teaching in Bourdon et al. that the seals perform any function other than a sealing function. To assert otherwise is not supported by the disclosure of Bourdon et al., and if, in fact, as the Examiner suggested, the seals 30, 40 also retain the contact member, then the retention fingers 11 of Bourdon et al. would be surplusage. However, it is clear from the disclosure of Bourdon et al. that the retention fingers 11 are not surplusage. Thus, the Examiner's claim that the seals 30, 40 are in fact retention members is mere speculation unsupported by the disclosure of Bourdon et al.

Moreover, the Examiner directs the applicant to Figures 8 and 11 for the contention that the retaining inserts 10 provide retention and an ungapped position between the

retention fingers 11 and the contacts 20. However, Figures 8 and 11 are side views of the retention inserts 10. All of the top or bottom views, as well as many other of the side views, indicates that the retention fingers do not provide an ungapped condition between the retention insert and the contact. Rather, by virtue of the fact that they are retention fingers, there are gaps between adjacent fingers that result in there being gaps between the retention insert and the contacts. Thus, the Examiner's position taken in the February 11, 2002 Advisory Action does nothing to support the Examiner's suggestion that the connector of representative claim 1 is rendered obvious by Bourdon et al. Accordingly, for at least the above reasons, applicant asserts that Bourdon et al. does not suggest the connector recited in representative claim 1. As such, the Examiner erred in rejecting claims 1-4, 6-8, 11-20, 22, 23, 25 and 26 under 35 U.S.C. § 103(a) as being unpatentable over Bourdon et al.

2 Bourdon et al. Does Not Render Claims 5, 9, 10, 21, 24 and 27 Obvious Under 35 U.S.C. § 103(a)

Representative claim 9 recites an electrical connector comprising a dielectric housing having a plurality of substantially open receptacles arranged in an array which is suitable for an electrical connector. Each receptacle has a through axis. A plurality of electrically conductive contacts are positioned within at least some of said receptacles so as to provide an array of contacts arranged to be suitable for an electrical connector. A plurality of retention members are within the receptacle, at least one of said retention members engaging at least one of said contacts so as to impart an ungapped condition to the connector at the location of the retention member within the housing. The ungapped condition of the connector substantially prevents passage of liquid through the open receptacles having said retention members

therewithin. The contact has a terminal portion is bent after insertion into said receptacle.

In rejecting representative claim 9, the Examiner posits that Bourdon et al. shows all the features recited in claim 9, except that Bourdon et al. does not show the terminal portion being bent. In order to overcome this shortcoming of Bourdon et al., the Examiner took "Official Notice" that such a feature is well known in electrical connectors, and that it would have been obvious to one of ordinary skill in the art at the time of the invention to make that modification to Bourdon et al. Applicant disagrees with the Examiner's contention for a number of reasons.

First, for at least the reasons recited in Section VIII.C.1, Bourdon et al. fails to disclose an electrical connector having "retention members engaging at least one of said contacts so as to impart an ungapped condition to the connector at the location of the retention member within the housing."

Moreover, applicant respectfully disagrees with the Examiner's assertion that it would have been obvious to one of ordinary skill in the art at the time of the invention to make the modification to Bourdon et al. as suggested by the Examiner, and further disagrees that it is appropriate to take "Official Notice" of something that is neither disclosed or suggested in the reference cited by the Examiner.

In order to sustain an obviousness rejection under 35 U.S.C. § 103(a), the references combined must provide the motivation to make the combination, not the invention disclosed by the applicant. As stated in the oft-cited case of *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984) (emphasis in original):

Obviousness cannot be established by combining the teaching of

the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under section 103, teachings of references can be combined *only* if there is some suggestion or incentive to do so.

Applicant respectfully submits that the Examiner is building a mosaic from the prior art (and that which is not shown in the art cited to reject representative claim 9) in order to recreate applicants' claimed invention. This is clearly an impermissible recreation using hindsight. For example, the Court of Appeals for the Federal Circuit admonished in In re Fritch, 972 F.2d 1260, 1266 (Fed. Cir. 1992):

"Although couched in terms of combining teachings found in the prior art, the same inquiry must be carried out in the context of a purported obvious 'modification' of the prior art. The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification....

"It is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that '[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.' [Citing In re Fine, 837 F.2d 1071, 1075 (Fed. Cir. 1988)].

As to the Examiner's claim that it would have been obvious to modify Bourdon et al. to have terminals having contact portions that are bent, nothing of the sort is suggested by Bourdon et al. Rather, if one were to bend the contact portions of the terminals of Bourdon et al. it would be impossible to mate the connector disclosed in Bourdon et al. with its mating connector. The contact portions of the terminals of Bourdon et al. are straight for the very reason that they are necessary to be straight to mate with a mating connector. Therefore, contrary to the

Examiner's suggestion, it would not have been obvious to modify Bourdon et al. as suggested by the Examiner. Moreover, Official Notice has no applicability in this situation because even if one were to take Official Notice of what the Examiner wants Official Notice to be taken of, the bottom line is that the suggested modification would result in the connector of Bourdon et al. being incapable of mating with its mating connector. Accordingly, for at least the above reasons, the Examiner erred in rejecting claims 5, 9, 10, 21, 24 and 27 under 35 U.S.C. § 103(a) as being unpatentable over Bourdon et al.

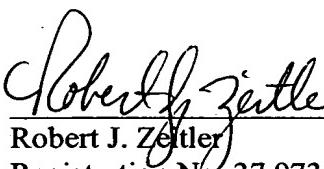
IX. CONCLUSION

For all of the above reasons, it is respectfully submitted that the appealed claims do define an electrical connector that is not disclosed in or suggested by the relied on reference. Accordingly, it is respectfully submitted that the Examiner's rejection of the claims on appeal should not be sustained and therefore should be reversed.

Respectfully submitted,
MOLEX INCORPORATED

Date: May 20, 2002

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**IN UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Applicants: Kent E. Regnier

Application: CONNECTOR HAVING SUPPORTIVE BARRIER COMPONENTS

Serial No.: 09/482,135

Filing Date: January 12, 2000

Art Unit: 2839

Examiner: C. Prasad

Case: 99-247 US

APPENDIX A

1. An electrical connector, comprising:

a dielectric housing having a plurality of substantially open receptacles arranged in an array which is suitable for an electrical connector, each said receptacle having a through axis; a plurality of electrically conductive contacts positioned within at least some of said receptacles so as to provide an array of contacts arranged to be suitable for an electrical connector;

a plurality of retention members within the receptacle, at least one of said retention members engaging at least one of said contacts so as to impart an ungapped condition to the connector at the location of the retention member within the housing; and

said ungapped condition of the connector substantially prevents passage of liquid through the open receptacles having said retention members therewithin.

2. The electrical connector in accordance with claim 1, wherein said retention member has an opening therethrough, and said electrically conductive contact is positioned through said retention member opening and substantially fills said opening.

3. The electrical connector in accordance with claim 2, wherein said receptacle of the housing has a stop surface within the receptacle, and wherein said retention member is between said stop surface and a portion of said electrically conductive contact.

4. The electrical connector in accordance with claim 1, wherein said electrically conductive contact has a first portion and a generally opposing second portion, a demarcation between said first and second portions of the contact being generally at said retention member, said first and second portions being at least partially within said housing, and said retention member is in contact with the respective first and second portions within the housing to thereby contribute to said ungapped condition.

5. The electrical connector according to claim 4, wherein said first portion of the electrically conductive contact generally lies along said through axis, while said second portion of the contact is at an acute angle relative to said through axis.

6. The electrical connector according to claim 1, wherein said ungapped condition imparts compliant and stable mount characteristics to said contacts.

7. The electrical connector according to claim 1, wherein said array of contacts is in a 1 mm grid.

8. The electrical connector according to claim 1, wherein said array of contacts is in a 0.05 inch grid.

9. The electrical connector according to claim 1, wherein said contact has a terminal portion is bent after insertion into said receptacle.

10. The electrical connector according to claim 9, wherein said formed terminal portion had been subjected to post-assembly bending for terminal retention.

11. The electrical connector according to claim 1, wherein said dielectric housing is a unitary member.

12. The electrical connector according to claim 1, wherein said dielectric housing includes a plurality of housing component strips.

13. The electrical connector according to claim 1, wherein said retention member has an opening therethrough, and a portion of said contact is within and in engagement with said retention member opening.

14. The electrical connector according to claim 1, wherein said retention member has an external surface which engages said receptacle.

15. The electrical connector according to claim 14, wherein said receptacle has a stop surface, and said retention member external surface abuts said stop surface.

16. The electrical connector according to claim 14, wherein said receptacle has an interior surface which is generally parallel to said through axis, and said retention member external surface abuts said receptacle interior surface.

17. The electrical connector according to claim 13, wherein said retention member has an external surface which engages said receptacle, and a force fit condition is present between said contact portion and said retention member opening and between said receptacle and said retention member external surface.

18. The electrical connector according to claim 17, wherein a force fit condition is present between said receptacle interior surface and said retention member external surface.

19. The electrical connector according to claim 1, wherein said retention member is

resilient.

20. The electrical connector according to claim 19, wherein said retention member is compressed within said receptacle.

21. The electrical connector according to claim 1, wherein said contact has a land contact surface at one end thereof and a deflective terminal at an opposite end thereof.

22. An electrical connector, comprising:

a dielectric housing having a plurality of substantially open receptacles arranged in an array which is suitable for an electrical connector, each said receptacle having a through axis;

a plurality of electrically conductive contacts positioned within at least some of said receptacles so as to provide an array of contacts arranged to be suitable for an electrical connector;

a plurality of retention members within the receptacle, at least one of said retention members engaging at least one of said contacts so as to impart an ungapped condition to the connector at the location of the retention member within the housing;

a retention member opening through said retention member, said electrically conductive contact being positioned through said retention member opening so as to substantially fill said opening;

said electrically conductive contact has a first portion and a generally opposing second portion, a demarcation between said first and second portions of the contact being generally at said retention member, said first and second portions being at least partially within said housing, and said retention member is in contact with the respective first and second portions within the housing to thereby contribute to said ungapped condition; and

said ungapped condition of the connector substantially prevents passage of liquid through the open receptacles having said retention members therewithin and provides compliant mounting of said contact within said receptacle.

23. The electrical connector in accordance with claim 22, wherein said receptacle of the housing has a stop surface within the receptacle, and wherein said retention member is between said stop surface and a portion of said electrically conductive contact.

24. The electrical connector according to claim 22, wherein said formed terminal portion is bent after insertion into said receptacle.

25. The electrical connector according to claim 22, wherein said retention member has an external surface which engages said receptacle, said receptacle has a stop surface, and said retention member external surface abuts said stop surface, said receptacle has an interior surface which is generally parallel to said through axis, and said retention member external surface abuts said receptacle interior surface.

26. The electrical connector according to claim 22, wherein said retention member is resilient and is compressed within said receptacle.

27. The electrical connector according to claim 22, wherein said contact has a land contact surface at one end thereof and a deflective terminal at an opposite end thereof.